

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau



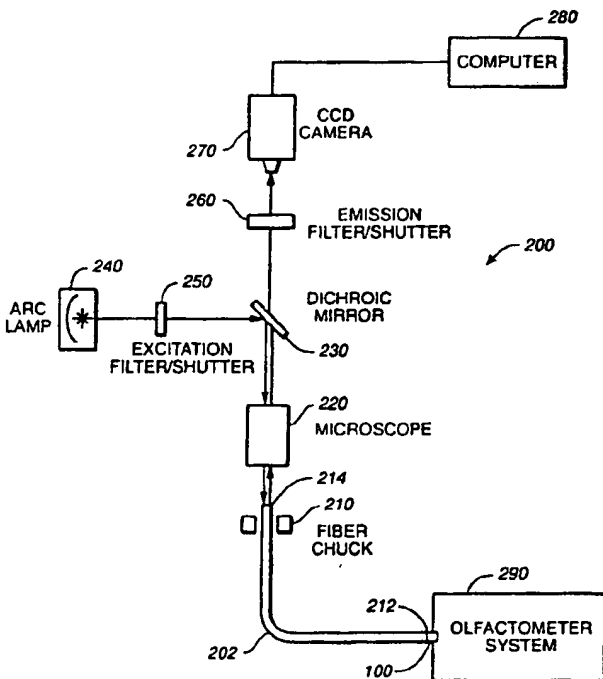
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : <b>G01N 21/64, 21/77</b>		A3	(11) International Publication Number: <b>WO 00/13004</b>
			(43) International Publication Date: 9 March 2000 (09.03.00)
(21) International Application Number: PCT/US99/19624 (22) International Filing Date: 26 August 1999 (26.08.99) (30) Priority Data: 09/140,352 26 August 1998 (26.08.98) US (71) Applicant (for all designated States except US): TRUSTEES OF TUFTS COLLEGE [US/US]; 136 Harrison Avenue, Boston, MA 02111 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): WALT, David, R. [US/US]; 4 Candlewick Close, Lexington, MA 02178 (US). DICKINSON, Todd, A. [US/US]; Apartment 1133, 3435 Lebon Drive, San Diego, CA 92122 (US). (74) Agents: BREZNER, David, J. et al.; Flehr Hohbach Test Albritton & Herbert LLP, Suite 3400, 4 Embarcadero Center, San Francisco, CA 94111-4187 (US).		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  Published With international search report.  (88) Date of publication of the international search report: 8 June 2000 (08.06.00)	

(54) Title: COMBINATORIAL POLYMER SYNTHESIS OF SENSORS FOR POLYMER-BASED SENSOR ARRAYS

(57) Abstract

A combinatorial synthesis method for fabricating unique families of discrete copolymer sensors and copolymer gradient sensors is provided. The method employs combinatorial copolymer synthesis of discrete monomer or oligomer combinations as well as spatially-varying combinations for generating large numbers of analyte-discriminating sensors from a limited selection of initial monomer and oligomer compositions. The method can be applied to either analyte-specific sensors or sensor arrays or semi-selective sensors and cross-reactive sensor arrays which employ virtually any known physicochemical transduction mechanism for detecting analytes. Since the analyte response characteristics of such copolymer sensors are not limited to a linear proportional ratio of the monomer or oligomer combinations employed, the resulting copolymer sensors provide for increased diversity in sensor and sensor array response characteristics for discriminating between a variety of materials and for detecting and identifying analytes in fluid samples.



BEST AVAILABLE COPY

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TC	Togo
BB	Barbados	CH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LJ	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 99/19624

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7 601N21/64 601N21/77		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC 7 601N		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used)		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	WO 99 00663 A (DOLEMAN BRETT ; SANNER ROBERT (US); GRUBBS ROBERT H (US); LEWIS NAT) 7 January 1999 (1999-01-07) page 10, line 29 -page 11, line 9 claims 1,176  -/-	1,3,5-7, 9,11-14
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "B" document member of the same patent family		
Date of the actual completion of the international search  1 March 2000		Date of mailing of the international search report  08/03/2000
Name and mailing address of the ISA European Patent Office, P.B. 5010 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3018		Authorized officer  Krametz, E

Form PCT/ISA/210 (second sheet) (July 1992)

# INTERNATIONAL SEARCH REPORT

Intern. Application No  
PCT/US 99/19624

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	M C LONERGAN: "ARRAY-BASED VAPOR SENSING USING CHEMICALLY SENSITIVE, POLYMER COMPOSITE RESISTORS" IEEE AEROSPACE APPLICATIONS CONFERENCE. PROCEEDINGS, XX, XX, no. 3, 8 February 1997 (1997-02-08), pages 583-631, XP002078726 page 587, left-hand column, paragraph 3 -right-hand column, paragraph 2 page 590, left-hand column, paragraph 3 -right-hand column, paragraph 2	1,7,13
Y		3-6, 9-12,14
Y	US 5 244 636 A (WALT DAVID R ET AL) 14 September 1993 (1993-09-14) cited in the application column 4, line 53 -column 7, line 9 column 10, line 44 - line 56	3-6, 9-12,14
A		1,7,13
A	EP 0 572 157 A (PURITAN BENNETT CORP) 1 December 1993 (1993-12-01) page 3, line 55 -page 4, line 59 figure 1	4-6, 10-12
A	DICKINSON T A ET AL: "GENERATING SENSOR DIVERSITY THROUGH COMBINATORIAL POLYMER SYNTHESIS" ANALYTICAL CHEMISTRY, US, AMERICAN CHEMICAL SOCIETY. COLUMBUS, vol. 69, no. 17, 1 September 1997 (1997-09-01), pages 3413-3418, XP000720847 ISSN: 0003-2700 cited in the application page 3414, left-hand column, paragraph 3 -page 3417, right-hand column, paragraph 3	1,3,5-7, 9,11-14
BEST AVAILABLE COPY		

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/19624

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9900663 A	07-01-1999	AU 8175598 A	19-01-1999
US 5244636 A	14-09-1993	US 5244813 A	14-09-1993
		US 5320814 A	14-06-1994
		US 5250264 A	05-10-1993
EP 0572157 A	01-12-1993	US 5266271 A	30-11-1993
		CA 2095414 A	23-11-1993
		JP 6058880 A	04-03-1994

BEST AVAILABLE COPY